

WHAT IS CLAIMED IS:

[c1] 1. A distributed receiver system for communicating transmitted reference ultra wideband communications signals, the distributed receiver system comprising:

a receiver front end downconverter comprising a correlator for producing ultra wideband pulses from the transmitted reference ultra wideband communications signals;

a digitizer connected to the receiver front end downconverter for receiving and digitizing the ultra wideband pulses;

a high bandwidth cable connected to the digitizer for receiving the digitized ultra wideband pulses; and

a centralized digital processing module connected to the high bandwidth cable for interpreting the digitized ultra wideband pulses.

[c2] 2. The distributed receiver system of Claim 1 further comprising an antenna connected to the receiver front end downconverter for receiving the transmitted reference ultra wideband communications signals.

[c3] 3. The distributed receiver system of Claim 2 wherein the antenna is configured to be positioned between a ceiling and a drop ceiling.

[c4] 4. The distributed receiver system of Claim 2 wherein the receiver front end downconverter further comprises a preamplifier connected to the antenna and the correlator for amplifying the received transmitted reference ultra wideband communications signals.

[c5] 5. The distributed receiver system of Claim 4 wherein the correlator comprises a delay element connected to the preamplifier for delaying the transmitted reference ultra wideband communications signals and a mixing element connected to the preamplifier and the delay element for mixing the delayed transmitted reference

ultra wideband communication signals with the transmitted reference ultra wideband communications signals.

[c6] 6. The distributed receiver system of Claim 5 wherein the receiver front end downconverter further comprises filter for filtering the correlated ultra wideband communications signals.

[c7] 7. The distributed receiver system of Claim 1 further comprising a modem connected between the digitizer and the high bandwidth cable for supplying the digitized ultra wideband pulses to the high bandwidth cable.

[c8] 8. The distributed receiver system of Claim 7 wherein the digitizer further comprises:

an analog to digital device for digitally converting the ultra wideband pulses;
and

a clock connected to the analog to digital device and the modem for synchronizing operations on the ultra wideband pulses.

[c9] 9. The distributed receiver system of Claim 8 wherein the analog to digital device further comprises:

a sampler connected to the receiver front end downconverter and the clock for sampling the ultra wideband pulses;

a quantizer connected to the sampler and the clock for quantizing the samples of the ultra wideband pulses into a predetermined number of quantizer levels; and

an encoder connected to the quantizer and the clock for encoding the quantized samples of the ultra wideband pulses.

[c10] 10. The distributed receiver system of Claim 1 wherein the high bandwidth cable comprises a fiber optic cable.

[c11] 11. The distributed receiver system of Claim 1 wherein the high bandwidth cable comprises a coaxial conductor cable.

[c12] 12. The distributed receiver system of Claim 1 wherein the centralized digital processing module comprises a plurality of decoder machines.

[c13] 13. The distributed receiver system of Claim 12 wherein each of the plurality of decoder machines comprises a field programmable gate array.

[c14] 14. A distributed receiver system for communicating transmitted reference ultra wideband communications signals, the distributed receiver system comprising:

a receiver front end downconverter comprising a correlator for producing ultra wideband pulses from the transmitted reference ultra wideband communications signals;

a plurality of digitizers connected to the receiver front end downconverter for receiving and digitizing the ultra wideband pulses, each of said plurality of digitizers comprising:

an analog to digital device connected to the receiver front end downconverter for digitally converting the ultra wideband pulses; and

a clock connected to the analog to digital device for synchronizing operations on the ultra wideband pulses;

a modem connected to each of the plurality of digitizers and the clock for communicating the digitized ultra wideband pulses;

a high bandwidth cable connected to the modem for receiving the digitized ultra wideband pulses; and

a centralized digital processing module connected to the high bandwidth cable for interpreting the digitized ultra wideband pulses.

[c15] 15. The distributed receiver system of Claim 14 further comprising an antenna connected to the receiver front end downconverter for receiving the transmitted reference ultra wideband communications signals.

[c16] 16. The distributed receiver system of Claim 15 wherein said antenna is configured to be positioned between a ceiling and a drop ceiling.

[c17] 17. The distributed receiver system of Claim 14 wherein the analog to digital device further comprises:

a sampler connected to the receiver front end downconverter and the clock for sampling the ultra wideband pulses;

a quantizer connected to the sampler and the clock for quantizing the samples of the ultra wideband pulses into a predetermined number of quantizer levels; and

an encoder connected to the quantizer and the clock for encoding the quantized samples of the ultra wideband pulses.

[c18] 18. The distributed receiver system of Claim 14 wherein the high bandwidth cable comprises a fiber optic cable.

[c19] 19. The distributed receiver system of Claim 14 wherein the high bandwidth cable comprises a coaxial conductor cable.

[c20] 20. The distributed receiver system of Claim 14 wherein the centralized digital processing module comprises a plurality of decoder machines.

[c21] 21. The distributed receiver system of Claim 20 wherein each of the plurality of decoder machines comprises a field programmable gate array.

[c22] 22. A method for receiving and demodulating spread spectrum signals, the method comprising the steps of:

sensing spread spectrum signals;

downconverting the sensed spread spectrum signals;

sampling the downconverted sensed spread spectrum signals;

quantizing the sampled spread spectrum signals;

encoding the quantized spread spectrum signals;

providing the encoded spread spectrum signals to a centralized digital processor; and

processing the transported spread spectrum signals to determine information content contained in the spread spectrum signals.

[c23] 23. The method of Claim 22 wherein the spread spectrum signals comprise ultra wideband communications signals.

[c24] 24. The method of Claims 23 wherein the ultra wideband communications signals comprise transmitted reference ultra wideband communications signals.

[c25] 25. A method for receiving and demodulating transmitted reference ultra wideband communications signals transmitted from at least one ultra wideband transmitter, the method comprising the steps of:

receiving the transmitted reference ultra wideband communications signals using an antenna;

downconverting the transmitted reference ultra wideband communications signals into ultra wideband pulses;

sampling the ultra wideband pulses;

quantizing the ultra wideband pulses into a predetermined number of quantizer levels;

encoding the ultra wideband pulses;

providing the ultra wideband pulses to a centralized digital processor;

processing the ultra wideband pulses using a logic tree to determine information content contained in the transmitted reference ultra wideband communications signals; and

identifying a particular one of said at least one ultra wideband transmitter from the step of processing.

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